REMARKS

Reconsideration and allowance of the above referenced application are respectfully requested.

Applicant herewith affirms the election of the group 2 claims 6 - 26. Claims 1 - 5 are canceled.

The objections, and rejections based on 35 USC 112, second paragraph, have been obviated herein by amendment.

Claims 6 - 9, 11, 12, 14, 15, 17 - 22, 25 and 26 stand rejected under 35 USC 102b as allegedly being anticipated by Cabasso, U.S. patent No. 5,783,325. This contention is respectfully traversed, and it is respectfully suggested that the rejection does not meet the patent office's burden of providing a prima facie showing of unpatentability.

'325 clearly does teach a system that includes poly(vinylidene flouride). As noted by the rejection, column 4 lines 19 - 25 describe poly(vinylidene flouride) being used. However, poly(vinylidene flouride) is not used as part of the catalyst ink mixture, and is not added to a mixture including catalytic material and poly(vinylidene flouride). Rather, column 4 describes adding the poly(vinylidene flouride) to an activated carbon blend in order to control the porosity and pore size of the gas diffusion electrodes.

This is described in more detail in column 6. The

poly(vinylidene flouride) is added to carbon particles to form the basic matrix of the gas diffusion electrodes. The poly(vinylidene flouride) is used to form the structure of the electrode. Column 6 lines 34 through 35 described a two-step method. A first method meet forms a gas diffusion layer according to the technique of claims 23 - 33; that is it forms the basic structure of the coagulation liquid. The second step forms the catalyst layer that is painted on within airbrush. The catalyst ink has catalytic material in it. However, there is no teaching or suggestion of poly(vinylidene flouride) being added to this catalyst ink. Therefore, it is respectfully suggested that there is no teaching or suggestion of the specifics of claims 6, and specifically there is no teaching or suggestion of mixing components comprising a catalytic material and the poly(vinylidene flouride), to form a catalyst ink for fuel cell, as claims. The catalyst ink of '325 does not include poly(vinylidene flouride). Rather, the poly(vinylidene flouride) is used in completely different step of the operation. Therefore, all of these claims should be allowable for reasons discussed above.

Claim 7 defines adding a membrane plasticizer to the catalyst ink mixture. While '325 does teach using a plasticizer, it does not teach adding that plasticizer to the

catalyst ink as claims.

The remaining claims should be allowable for similar reasons. In summary, nothing in '325 teaches or suggests adding these materials to the catalyst ink, as claims.

Claims 16 and 24 stand rejected under 35 USC 103 based on '325. The rejection admits that '325 does not teach roughening the surface of the membrane prior to applying the catalyst ink. The rejection states that such a step would have been obvious. However, this is respectfully traversed, and it is respectfully suggested that nothing in the prior art fairly teaches this surface roughening. As described on page 6 lines 7 - 8, the roughened surface may provide additional anchoring sites for the catalyst and polymer. This is not taught or suggested by the '325 prior art, as explicitly admitted in the official action. Therefore, it is respectfully suggested that this rejection is based on hindsight.

Claims 10 and 23 stand rejected over '325 in view of Kindler; U.S. patent No. 5,992,008. While '008 does teach using the liquid copolymer of the specified materials, it does not teach or suggest adding this to the catalyst ink, as claimed. Therefore, it is respectfully suggested that these claims should be additionally allowable.

The remaining rejected dependant claims should be allowable

for similar reasons to those discussed above. Specifically, none of the prior art teaches or suggests this specific combination being added to the catalyst ink as now claimed. It is respectfully suggested, for these reasons, that the rejection does not meet the patent office's burden of providing a prima facie showing of unpatentability.

In view of the above amendments and remarks, therefore, all of the claims should be in condition for allowance. A formal notice to that effect is respectfully solicited

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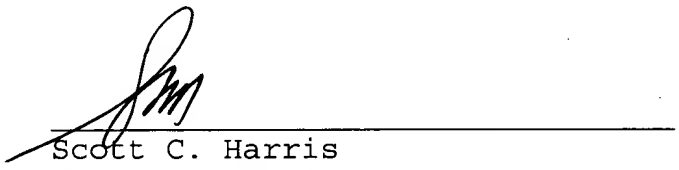
Respectfully submitted,

Date: 3/12/02



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Attached is a marked-up version of the changes being made by the current amendment.

Version with markings to show changes made

Please cancel claims 1 - 5.

Please amend the remaining claims as follows:

6. A process for making a catalyst ink for a fuel cell, comprising mixing components comprising a catalytic material and poly(vinylidene fluoride).

7. (Amended) The process of claim 6, further comprising adding [to the mixture] a membrane plasticizer to the catalyst ink.

8. (Amended) The process of claim 7, wherein the plasticizer is a high boiling point solvent.

9. The process of claim 7, wherein the plasticizer is N,N dimethylacetamide.

10. (Amended) The process of claim 6, further comprising adding to the mixture [a second] an ionomer comprising a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid.

11. A process for making an electrode for a fuel cell, comprising:

(a) providing a catalyst ink comprising a catalytic material and poly(vinylidene fluoride); and

(b) applying the catalyst ink to at least one side of a substrate.

12. The process of claim 11, wherein the substrate is a membrane.

13. The process of claim 12, wherein the membrane is a PSSA-PVDF membrane.

14. The process of claim 11, wherein the ink further comprises a plasticizer.

15. The process of claim 14, wherein the plasticizer is N,N dimethylacetamide.

16. (Amended) The process of claim 12, further comprising roughening [the] a surface of the membrane prior to applying the catalyst ink.

17. The process of claim 12, wherein the substrate is a backing.

18. The process of claim 17, wherein the backing is a carbon paper.

19. A process for making a membrane electrode assembly for a fuel cell, comprising:

(a) providing a catalyst ink comprising a catalytic material and poly(vinylidene fluoride);

(b) applying the catalyst ink to at least one side of a membrane; and

(c) bonding the membrane to at least one electrode.

20. The process of claim 19, wherein the membrane is bonded to the electrode at a temperature of greater than about 180 °C.

21. The process of claim 19, wherein the catalyst ink further comprises a plasticizer.

22. The process of claim 21, wherein the plasticizer is N,N dimethylacetamide.

23. The process of claim 19, further comprising adding to the catalyst ink a second ionomer comprising a liquid copolymer of tetrafluoroethylene and perfluorovinylethersulfonic acid.

24. (Amended) The process of claim 19, further comprising roughening [the] a surface of the membrane prior to applying the catalyst ink.

25. (Amended) The process of claim 19, wherein the electrode comprises a catalyst layer comprising a catalytic material selected from Pt, [and] Pt/Ru and an ionomer.

26. A fuel cell comprising a membrane electrode assembly, wherein the membrane electrode assembly is made by the process of:

(a) providing a catalyst ink comprising a catalytic material and poly(vinylidene fluoride);

(b) applying the catalyst ink to at least one side of a membrane; and

(c) bonding the membrane to at least one electrode.